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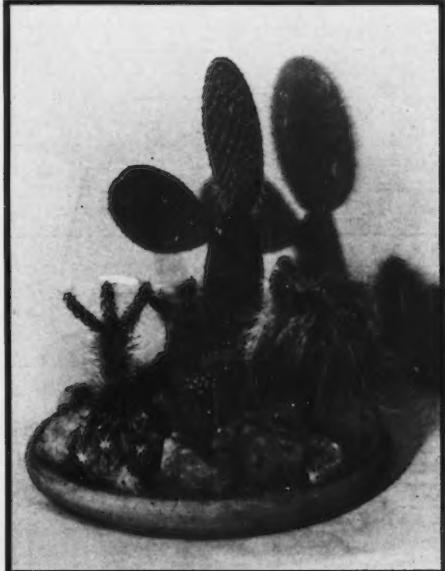
# CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society  
Of America

Vol. III

AUGUST, 1931

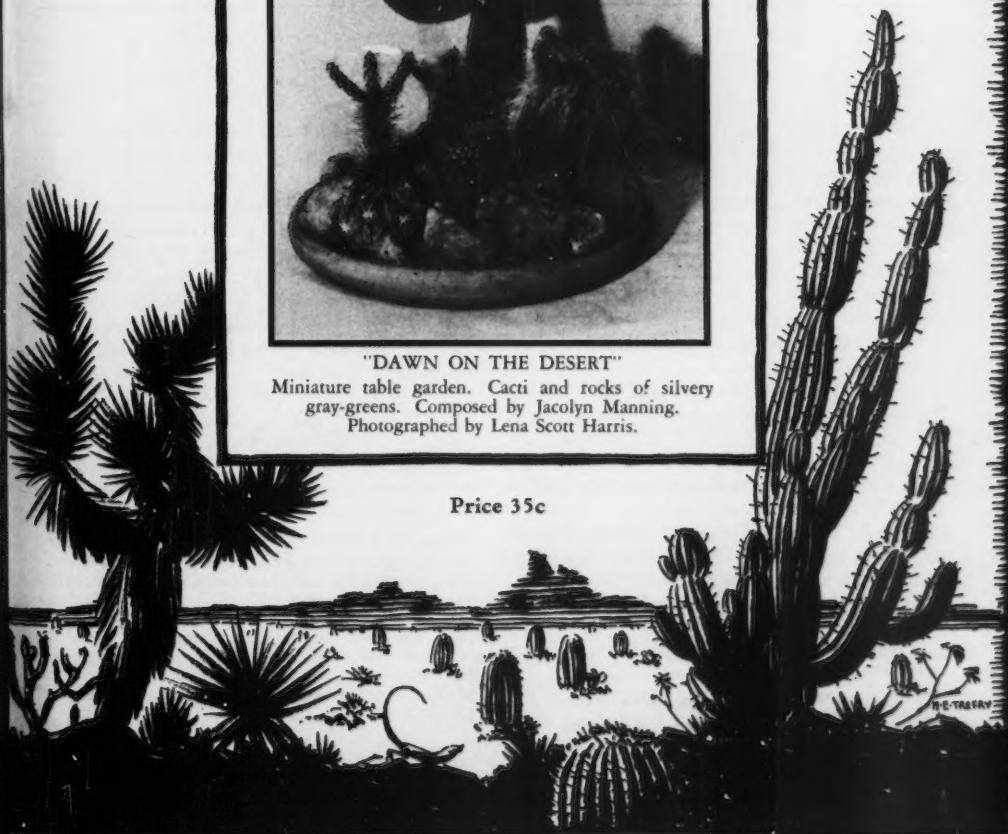
No. 2



"DAWN ON THE DESERT"

Miniature table garden. Cacti and rocks of silvery  
gray-greens. Composed by Jacolyn Manning.  
Photographed by Lena Scott Harris.

Price 35c



## CACTUS AND SUCCULENT JOURNAL

Published and Owned by

THE CACTUS AND SUCCULENT SOCIETY OF AMERICA

A monthly magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. "The Cactaceae," by N. L. Britton and J. N. Rose, has been adopted by this journal for purposes of identification. (Membership and subscription \$3.00 per year, foreign \$3.50.) Mail membership application and subscription to the Secretary, Mr. W. M. Ketteringham, 610 West 65th Street, Los Angeles, Calif.

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VOLUME III

AUGUST, 1931

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ADDITIONS TO KNOWLEDGE OF  
MEXICAN CACTACEAE  
(Review by N. L. BRITTON)

Professor Helia Bravo contributes an account of the Cactaceae of the Valley of Oaxaca<sup>1</sup>, with excellent photographic illustrations of twelve of the species. The enumeration includes native species in the following genera: *Nopalea* 1; *Opuntia* 4; *Pachycereus* 1; *Lemaireocereus* 3; *Aporocactus* 1; *Ferocactus* 2; *Coryphantha* 2; *Neomammillaria* 3; *N. Schmollii*, found near Mitla, described as new. This is followed by descriptions and illustrations of four new *Neomammillaria*<sup>2</sup>,

(1) *N. Schmollii*, above noted, dedicated to Señora Schmoll, with suggested relationship to *N. Celsiana*.

(2) *N. Ochoterenae*, with similar relationship, also from Oaxaca, named in honor of Professor Ochoterena.

(3) *N. Patonii*, from the Marias Islands, named in memory of Don Carlos Patoni, and compared with *N. mazatlanensis*.

(4) *N. Hamiltonboytæ*, dedicated to Mrs.

Sherman Hoyt (nee Minerva Hamilton), collected in Queretaro, and compared with *N. Johnstonii*.

Professor Bravo's account of the Cactaceae of Tebuacan, published in the preceding volume of the *Anales del Instituto de Biología*, and reviewed in this JOURNAL<sup>3</sup>, has been published in pamphlet form<sup>4</sup>, with little change from the original text; we note that the genus *Solisia*, merged with *Pelecyphora* in the original, is here recognized as distinct.

<sup>1</sup>Journ. Cactus. & Succ. Soc. 2: 422.

<sup>2</sup>Contribución al Conocimiento de las Cactaceas de Tehuacan. Pamphlet, pp. 52, fig. 1:31. Chapultepec. 1931.

[EDITOR'S NOTE: We are grateful to Dr. Britton for his contributions over our first two years and we are glad that he feels that the CACTUS JOURNAL is worthy of his attention. Dr. Britton is our Honorary President of the Cactus and Succulent Society and became our first life member at the time when the JOURNAL was making its struggle for existence and recognition. We trust that our reprinting of Vol. I of THE CACTACEAE will show our appreciation of Dr. Britton's work on Cacti.]

<sup>1</sup>Cactaceae del Valle de Oaxaca.—*Anales del Instituto de Biología, Universidad Nacional de México*, 2: 117-126, fig. 1:12. 1931.

<sup>2</sup>Cuatro especies nuevas del género *Neomammillaria*, *Ibid.* 127-131, fig. 1-4.



"NOONDAY ON THE DESERT"

Miniature table garden composed by Jacolyn Manning. Photography and coloring by Lena Scott Harris.

## Miniature Desert Gardens

By JACOLYN MANNING, M.D.  
(Text and photos copyright to author.)

When composing the most difficult and picturesque table gardens, miniature scenes from the American deserts, it is well to have in mind a definite memory picture, or mayhap a color plate of some western desert found in the NATIONAL GEOGRAPHIC magazine.

An analysis of any actual desert scene is a study in beauty, grandeur, and simplicity with rocks, sand, and a plant or two. On the arid lands of the Mojave or Colorado deserts, where each plant must be a monopolist of its short allowance of rain or dew, it will be noted that the native growth, however abundant, is well spaced out.

There are a few exceptions to this general rule, instances of the most happy companionship, where for example, a baby-seedling giant Sahuaro sprouts in the shade of the misty smoke-tree and rises into a great pillar which the indigo-blue bloom of the smoke-tree carries and adorns.

In assembling the properties, however, with which you are about to create this most striking of all pedestal gardens, lean toward a studied simplicity, discarding all save the few happy essentials of your proposed desert scene.

The base you have secured for your miniature desert garden is excellent. It is a flat unglazed

flowerpot saucer twenty inches in diameter. It is wholly inconspicuous, as it should be. Your garden will be so continuously exposed to evaporation, and will be watered so sparingly, that



"SUNSET ON THE DESERT"

Miniature table garden. In various shades of red.  
Composed by Jacolyn Manning. Photograph  
by Lena Scott Harris.

drainage other than the porosity of the container is not needed. If you were not intending a bold and striking effect your garden might be achieved in a ten inch plate or one even less in size. Our favorite base for a desert picture is a 20-in. sand-colored terra cotta bird-bath, flat, 2-in. deep, and mounted on 1-in. feet. These may be obtained at any garden pottery works.

You have had in mind for some weeks the setting you are about to compose — a desert sunset — just a slash of deep shadow in a mass of tango-colored rocks which the level rays of the declining sun are softening to mauve. What else do you recall of that scene? Nothing but rocks and color? Very good. Rocky cliffs of startling color frame the desert of Death Valley.

If you live in any of the great states of the far West you have doubtless collected rocks, both volcanic and stratified, from the famous "Red Beds" that traverse these regions. Select from your pile a jagged mass of fused red rock about 15-in. high and place it upright and one side of the center of your garden base.

You have ready some slabs of stratified red gypsum which you have split with a heavy knife and hammer. Stand one of these slabs in the sand upright with its flat side two inches from the cliff. Place a second slab, somewhat shorter, parallel with and two inches from its mate. Scatter handfuls of broken talus all about the base of these red cliffs. Fine!

But our beautiful red cliffs are wobbling! It is an earthquake! We will cure that earth tremor at once. Mix a cupful of cement with three cups of sand, add water to make a stiff mash, and a little red kalsomine for coloring. Turn out the sandy loam from your great dish and cement the rocks fast to its floor, using only enough cement to hold the rocks fast. Be sure the rocks are set at just the right angle to maintain the effect of a cleavage or faulting in the cliff, or the formation of a canyon wash, and have your canyon and highest elevation quite one side of the center of the base. (The cement work should be given a 24-hour interval to harden.) The container may be re-filled with equal parts of washed sand, — not sea sand — and garden loam with a little clay in it.

Was there any verdure in your desert sunset — a palo verde perhaps, or a Joshua tree with uplifted arms? Keeping our picture in scale we will simulate the praying Joshua tree with this common Cholla of the waste, or *Opuntia bigelovii* with its spreading arms.

Handling the cactus with a pair of plant tongs place it at one side of the cliff, and fasten the roots down firmly with two or three bits of rock packed about with sandy loam. Under the cliff at the farther side is a concave surface which can be filled with a pair of slow growing young red *Ferocactus acanthodes* with their terrible fishhook spines. At the rear of cliff place a group of small red *Echinocactus reichenbachii*, modest cousins of the elegant rainbow cactus, *E. rigidissimus*. Pound up some of the red rock on the old chopping block for talus, and scatter freely over the sand. Wet down the garden thoroughly with an ample spraying.

Regard your work from a distance of ten paces. You have reconstructed a scene of the painted desert and a sunset picture at that. You will note the mauve shadows have appeared and much else which you did not consciously place there. That subtle something you have builded into your miniature desert garden which will give delight to your friends and bring you many a trophy at the flower shows, is — atmosphere.

Atmosphere is worth striving for. You will find it in few of the overstuffed arrangements that will be shown as table gardens at the fall

flower shows. But it is instantly recognized by the discerning public. If and when you achieve it you will bring home many a blue or special ribbon, and many a trophy. The Japanese have this art of arranging table gardens in perfection so long as they limit themselves to suggesting Japanese gardens. But here on the Coast they fall down absolutely when they attempt to present a picture of the desert. The reason? The Japanese garden is the sum of infinite detail. The desert scene is one of striking simplicity.

Does that elusive atmosphere of the desert ever dignify or excuse the commercial bastard known as a "Cactus Bowl"? It could not for it is never present there. None but a thoughtless person could jam five or six unrelated cacti together into a narrow-based undrained dish, and abandon them to creeping death. As you value your perception of beauty never buy, make nor exhibit a "cactus bowl."

Rocks are useful in placing the cacti as well as decorative. They will anchor and support the plant until it is well rooted. If chosen with due regard to color values they provide much of the little garden's unique beauty and atmosphere. The West Coast ranges have a riot of colored rocks, stratified, fused, volcanic, and having the habit of carrying a geologist's hammer we have always found picturesque rocks in any part of

the United States where we have sojourned. Weathered limestone in Ohio, copper ores in North Carolina, glacial drifts along the Chippewa River of Wisconsin. Rocks are heavy shippers, and it is more fun to collect your own. Search of a dry run or a terminal moraine after heavy spring showers is often rewarded. Smoothly rounded cobble stone, and crystalline formations are unsuitable for the desert garden.

It is fascinating to mate your cacti to rocks sympathetic or neutral in color. Reproductions of four desert gardens worked out in definite color values are given in Plates Nos. I, II, III, IV. Number I, "Dawn on the Desert," was composed with cacti and rocks of a misty, silvery, gray-green. Number II, "The Desert at Noonday," was high-lighted by a yellow cholla whose spine-sheaths catch and reflect sunlight, set in rocks of orange-and-brown strata. Number III, "Sunset on the Desert," is all in flame-color and tango red; the rocks we collected in the Santa Susanna Mountains, and the cactus purchased at wayside stands. Number IV, "Night on the Desert," was the most difficult, for it was long before we found materials of just the correct colors. It is made up of amethystine rock which deepens to purple-black, desert cacti with gray and purple spines, gray sand and gravel, and a few fragments of the violet glass from Death Valley.



"NIGHT ON THE DESERT"

Amethystine rocks, gray and purple spined cactus. Violet glass from Death Valley. Composition Jacolyn Manning. Photograph by Berger.

## Greenhouses

By RALPH L. BOWMAN

Cacti, being native of almost every country from Canada to Patagonia, have been exposed to the extremes of soil and climate and have adapted themselves to the particular habitat in which they happen to be found. The majority of the cactus genera are found in hot and arid regions. With these facts in mind, it behoves one to construct a greenhouse with proper heat and ventilation controls so as to duplicate the climatic treatment they receive in their natural haunts as near as possible.

There are two objects of growing cacti under glass, namely: Where climatic conditions are too rigorous to keep them out of doors the year round while growing for decoration, collection or propagation; where climatic conditions are favorable to the growth the year round, but propagation is desirable to intensify growth, or to obtain scientific experimental data where perfect specimens are needed.

In more rigorous climates cacti are grown in conservatories allowing for the rather large proportions attained by some of the species of *Cereus* and *Opuntia*.

In climates where cacti grow naturally, greenhouses usually are used to intensify propagation. Under these conditions more care in the selection of the glass enclosure, as to the temperature and conditions, is required.

The work of a greenhouse builder is completed when he furnishes ample ventilation at the side walls and at the ridges. The grower then can ventilate the greenhouse to suit. Considering the many possibilities, not even scratched, for commercializing cactus propagation, it seems that a little attention to proper construction should go hand in hand with the science of propagation.

In brief, there are a few specifications for a modern greenhouse that are imperative:

The wood materials used in the construction of a greenhouse should be Redwood, clear and free from all imperfections, or Tank Grade Cypress. All wood materials should be given two coats of good paint before being erected and two coats after erection. The joints should be well smeared with a white lead paste when the greenhouse is being erected.

Although in a greenhouse used exclusively for cacti there is not as much water used as for general plant growth, there is considerable condensation which makes it necessary for all metal ma-

terials to be non-rustable, either brass or galvanized.



This view of the interior of a glass house, shows well arranged seedling plants of *Astrophytum myriostigma*, *Cephalocereus senilis*, *Pachycereus marginatus*, *Neomammillaria vetula*, *Neomammillaria candida*. The two spindle-stemmed plants are *Rhipsalis*, also growing from seed.

The only specification for glass, that should be carefully made, is that the glass is grade "B", "flat-drawn." Cylinder drawn glass will magnify the sun's rays on the plant and often do considerable damage.

Greenhouses used for any purpose should be heated by means of hot water or steam, circulated through pipe coils. The boiler should be located outside the greenhouse with a flue higher than the highest point of the greenhouse adjoining, sufficient in size to exhaust all gases. The use of coal-oil heaters and the like, inside of a greenhouse, has been proven detrimental to plant life. A recent invention, using electricity for heat, is proving very satisfactory for heating small greenhouses. The original cost and maintenance, in comparison with the steam and hot water types, is exceedingly low.

Benches should be supported by a galvanized pipe framework with two-inch Redwood materials used for the top. One-inch material is temporarily sufficient but will not ordinarily give more than a few years service.

The use of roll shades on a greenhouse reduces the temperature on the glass and in the greenhouse about twenty degrees below the outside prevailing temperature.

The roll shades are more attractive than whitewash on the glass and are much more efficient. When the shades are installed they should be ele-

vated at least six inches above the glass to allow ample air space.

Greenhouses are becoming very popular in Southern California and within a short time it is believed the majority of home owners will learn the real pleasure derived from watching plants grow and will include greenhouses in their building program.

#### NEW STAFF MEMBER

Mr. Minton Cronkhite, of San Marino, Calif., is our latest addition to the Editorial Staff. In six months Mr. Cronkhite has mastered as much "cactus" as most of us can absorb in three years. He has consented to describe his systematic methods of cataloguing in the September JOURNAL. Mr. Willis will then expose his methods and we hope Mrs. Wright will frankly comment on both methods.

#### SOIL MIXTURE

##### Editor Cactus Journal:

The writer of this being located in Northeastern Ohio is in anything but a good location to grow Cacti, but in spite of that fact about six years ago I received some Cacti and Succulents from a dealer in Southern California. Since that time I have acquired a collection of about seventy different species of Cacti and about twenty Succulents.

These except a few I store in the basement of my house, dormant or nearly so from about October 1 to May 1. The remainder of the year they are outside and take the weather as it comes, rain or shine. Generally too much rain for Cacti I suppose, but at that I have lost only a very few plants and these mostly due to my own neglect.

About four years ago I decided to experiment with soil combinations. First I tried it on some *Stapelia* and it was only a short time until I noticed more rapid and vigorous growth. Then I varied the combinations on various plants until I found what seemed to be the best. I now use nearly the same mixture for both Cacti and Succulents.

This spring my plants have put out better growth than ever before and most of them that are large enough bloom very well.

Although they get many soaking rains they seem to stand it very well. I keep them in individual pots.

In place of most of the sand usually used in preparing soil I use granulated slag from the iron and steel mills of the Cleveland, Youngstown and Pittsburgh districts; this is nearly as fine as good sand, very porous and contains some lime.

I make up the mixture about as follows:

Leaf mold gathered in the woods, pul-	
verized and screened.....	Two parts.
Ordinary soil from my garden (not	
very rich) screened.....	Two parts.
Fine sand.....	One part.
Granulated slag.....	Two parts.

I add about a level teaspoon full of slack lime and also about a like amount of bone meal fertilizer to each gallon of the soil mixture. I pot the plants in the usual way, that is, some stone or gravel at the

bottom of the pot, then the soil mixture and about one-half inch of clean sand at the top; this gives good drainage and at the same time does not dry out too fast.

R. N. FISK.

#### GLOCHIDS AND GREASE

No need to speak of the intense irritation of the human skin (and mental condition!) when one contacts with those pesky glochids or hair-bristles on certain cacti. You've got them, that's all! But one amateur is grateful for a friend's happy suggestion for relief, and so passes the information. Whether it is an old or a new remedy we know not—but it works! We have had quick relief ourself, when we had almost despaired of ridding our fingers of numbers of *Opuntia microdasys*' pet points.

Before washing the hands or attempting to worry those hairs out, simply grease your hands thickly, thoroughly, with lard or such. Allow it to remain on for a few moments, then wipe it off with a soft cloth, being careful to choose a fresh portion of the material for each wiping.

Our experience showed that this, followed by a regular washing in warm sudsy water, routed all the glochids we had gathered between and on the tips of our fingers. Try this the next time your hands are wearing the wee cacti hair-bristles, and your disposition riled therefrom.

C. D. B. (San Diego)

#### CONSERVATION

##### Editor Cactus Journal:

I noticed in the May issue of JOURNAL an article by the well-known seed collector, Mr. Broadway, of Trinidad, B. W. I., regarding the difficulty in collecting Cacti and other seeds, owing in some cases to the fruits being devoured by the birds.

I would like to bring to your attention and also to that of the members, another side to this problem, which not all of us have probably thought of before, and which I believe would have some effect toward causing us to be a little bit glad the birds like these particular fruits. We must of course admit that it is to be deplored that a shortage of desirable kinds of plants should be caused by the appetites of birds, etc., for palatable fruits, but:

I am sure some will agree with me that the birds in this manner cause a wider distribution of the plants by eating the fruits, and thus in one manner conserve plant material for future supplies, and make the plants in their native haunts more numerous. When the seeds are collected and sold, the consumers lose a certain percentage of them anyway, as of course is the case when they are distributed by birds and other agencies, but, as I have said, what grows in the native habitat, are there for future supply. Try to picture the birds not eating fruits and distributing seeds thereby, and you have the collector getting all the seeds from a limited number of plants. It is easy to see what will thus ensue. I believe the above on conservation is in line with Mr. Frick's remarks regarding *Euphorbia obesa*.

Yours very truly,

J. D. MITCHELL.

Curt Backeberg, Hamburg-Volksdorf, Im Sohrenfeld 15, is preparing for a field trip in the fall. Advance orders for plants and seeds should be made immediately.



By MARY NORWOOD LAWRENCE  
Assistant Editor  
376 N. Ave. 57, Los Angeles, Calif.

A new idea in florist's shops is presented in Los Angeles. Out on East 9th Street Mr. and Mrs. Buford W. Hall of Texas are doing a bit of pioneering in the way of nursery business. Three days a week a refrigerator car goes South to the Hyde Park Floral Company of Austin, packed with our own California flowers, and as many times during the same seven days a shipment of Texas cacti comes back, some in bulk, some in pots. A window full of dish gardens attract the eye of the passer-by, set in jars of Hall's own designs and made from Texas clay.

The Halls, father and two sons, have been in the flower business for years—the boys grew up with the flowers. Just into their teens they were shipping maiden-hair ferns to Eastern markets, but only since 1925 has cactus engaged their energies. In that year the two boys were driving back to Chicago to the F. T. D. convention and figured out a way to meet expenses by taking along some Texas cacti—little plants they could give away to advertise their state and incidentally, maybe, take a few orders. They got as far as Kansas City when a far-seeing florist insisted on taking all they had and paying for it. They sent for more and were handing out keepsakes at the Edgewater Hotel in Chicago, when the management found the souvenir hunters blocking the doors and a man named Miller, president of a wholesale allied grocery concern, trying to make terms for a million small plants to give away with the compliments of the food show they were putting on. Were the boys proud? Remember the craze had not hit yet, but it was to overwhelm us before long, and the Halls rode it on the waves. They were awarded first prize at the National Flower Show in Detroit. The next year another first award was pinned to their cactus exhibit at Louisville and they carried away a special prize later on at Philadelphia.

Down in South Texas it is too hot in summer, even in greenhouses where the thermometer teeters up and down between 105 and 120, to make flowers hold their bloom, hence the shipment from here. But cactus—just the thing. Late in the season this is cleared out of the glass houses and bulbous plants take their place. They tell us that from Marathon straight south to the border, which is 90 miles, it is one solid bed and they do say that the laws governing transportation are more liberally interpreted than in some other states.

Dr. Jacolyn Manning's versatile typewriter has for the moment turned from cactaceae to comedy. Four plays of American life which have been presented to flattering audiences within a brief time are just off the press. The Patcher is safe in saying that none of us so closely associated with her in the cactus organization had an idea that Dr. Manning's cerebrations could express themselves in the language, thought and law that these desert dramas radiate.

R. Grenfell Thomas, of St. Peters, South Australia, writes that the reason there are so few cactus col-

lectors in Australia is due to the spread of *Opuntia inermis* introduced into that country a few years ago. This is the most serious example of plant invasion ever recorded, with resulting wholesale destruction of dense *Opuntia* forests by the imported insect, "*Cactoblastis cactorum*."

This is rather alarming to a cactus enthusiast when he considers that his treasured collection, which has taken years to assemble, may be in danger of a like fate, if not constantly tended.

A new Japanese monthly magazine devoted to Cacti and Succulents has been received by the Librarian. It is published by Kyoraku, at Yokohama, Japan; is well illustrated, has 14 pages, and is the same size as THE JOURNAL. The Cactus Patcher is unable to review it further, save to say that the cover is pink.

The Texas Agricultural Experiment Station, at Winter Haven, has a new project on hand. Mortensen, superintendent of the station, and V. L. Cory of the Division of Botany plan to make a study of Cactaceae with reference to uses for ornamentals, and also their taxonomic relationship.

Mention was made recently of the speed with which the flower stalks grow on various agaves, especially on the larger varieties. Don Kissinger comes forward with a *Yucca whipplei* which leaped skyward at the rate of 10½ inches daily until a few days before it reached maturity. Now, all together, "Why that's nothing, I have one"—etc., etc.

Ferdinand Schmoll of Cadereyta, Qro., Mexico, has just mailed a snappy catalogue with a great list of available plants. The several shipments recently received in this country bear out its promises.

**EDITOR'S NOTE:** Many readers have enjoyed the series of articles by Mrs. Lawrence in the Los Angeles Times, and we hope to see many more in the future. Her articles are humanly interesting and furnish us newer fans with the experiences of the "Old-timers."

#### HOW TO PROPAGATE EUPHOBIA CAPUT MEDUSAE

Due to the kindnesses of other nurserymen, and with no credit to myself, who can only follow where others lead, I have learned to propagate *Caput medusae* with 100% success. Last spring Mr. Cornelius obtained for me two hundred various succulents from Los Angeles. Among them were twenty *Medusa* (minor) cuttings. I had heard that they almost never made real heads and only one did.

Later I questioned a nurseryman of long experience, a constructive intelligence and generous with the knowledge obtained from his experiments, and he told me to cut the tops off of the cuttings and new perfect plants would come from the bottom. I did so at once, saving the cuttings to root. That was last summer and nothing happened till this January. And now one has four perfect heads at the base, one three, and the rest each one. A year in the making but worth waiting for.

Even the erudite Mr. Bailey had not heard of this method, so I take it to be another contribution to succulent horticulture.

NEFF K. BAKKERS, San Diego.

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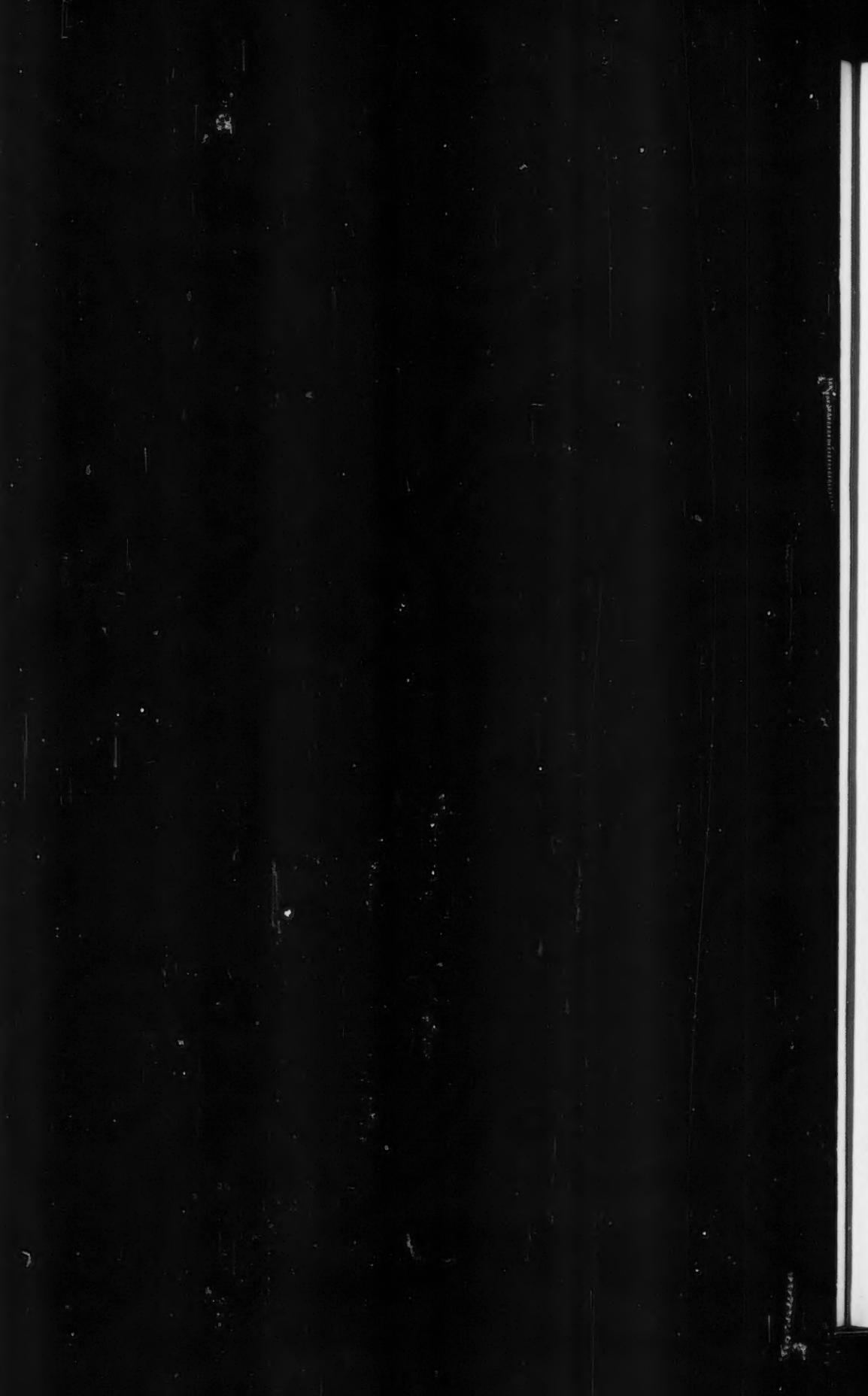
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## Reprinting Britton and Rose The Cactaceae Vol. I

### FOREWORD

The monumental work of Britton and Rose in four volumes is out of print. Though a goodly edition was published in the year 1919 there are no more to be had. Students of this family of plants are handicapped by their inability to secure a copy of this indispensable work. I have called the work monumental for the reason that in comparison to all previous efforts at monographing this family, it stands out like some towering monument.

The precision with which the mass of available material has been sorted, the conservatism with which new species and genera have been erected, the confirmatory explorations which have been achieved, the tabulation of sources, both of material and pictorial representation; its sincerity, lucidity of style together with its very complete synonymy, renders it an outstanding work in this or any other language.

Taxonomic science does not stand still, however, as even while the work was in process of publication it was found necessary for an appendix to be written, including notes, emendations, corrections and additional data including even such important material as the erection of new genera and species.

In the years which have elapsed since this work was published, much new material has been studied by many investigators, and many new facts have been discovered, some published in widely scattered publications, and many doubtlessly not recorded.

THE CACTUS AND SUCCULENT JOURNAL, owned by the Cactus and Succulent Society of America, has undertaken the reproduction of the Britton and Rose monograph together with remarks, notes, pictures and original researches tending to bring the world's knowledge of the Cactaceae up to date—a large and truly noble job.

There is only one way in which success can be achieved. It is too large for any one man, co-operation is the way. Every member of the Society should co-operate in this constructive work we are undertaking.

DR. A. D. HOUGHTON

### EDITOR'S PLAN

As an introduction to the reprint of Vol. I. of *The Cactaceae*, the Editor believes that Ysabel Wright's excellent Glossary articles should be combined and reprinted for reference. By careful study of these illustrated glossaries, the descriptions found in *The Cactaceae* will have a greater meaning.

The first reprint of Volume I of *The Cactaceae* will be exactly like the original—line for line, so that the historical value of the work will not be lost. After two years of co-operation from Carnegie Institute, Washington, D. C., they have shipped to us all the original material used in the original work which cost them \$58,000. The confidence shown by such an Institution should be a greater incentive for us to make this work a lasting monument for the Cactus and Succulent Society of America.

The center eight pages of each issue will be devoted to the reprinting, and they will carry their own page numbers to conform with Britton and Rose. These center eight pages may be removed and bound, or one can obtain, later, the reprint in the same page size as the original works complete with color plates.

There will be two additional pages devoted to additional illustrations, new material, corrections, revisions and discussions and comments. These pages may be used by all as a clearing house for the many questions that may arise. Mr. E. M. Baxter, Bellflower, Calif., will act as Secretary in compiling these two important pages and all new material should be reported to him. Mr. Baxter will have an interesting report for the first reprinting in the September issue.

The Editor has asked Dr. Houghton to help us with the mass of material which he has accumulated and his training in taxonomy will be of great value in this work. Mr. C. H. Hamilton of Flintridge has made a wonderful series of photographs of *Opuntias*, and he has consented to take charge of all photographic work. Mr. Baxter will name the balance of his board who will pass on all technical details.

## Shapes of *Opuntia* Joints

By YSABEL WRIGHT

Illustrations by MARGARET KINCHER

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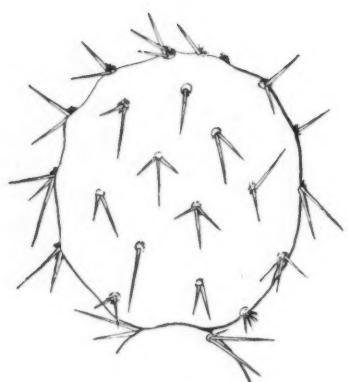


Fig. 1

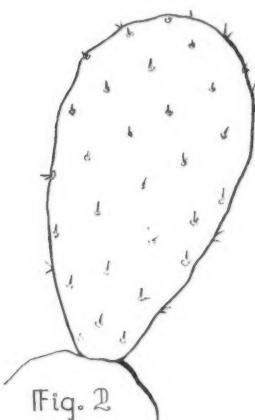


Fig. 2



Fig. 3

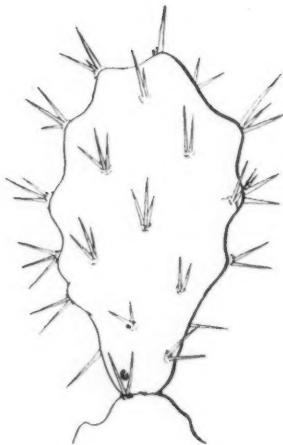


Fig. 4

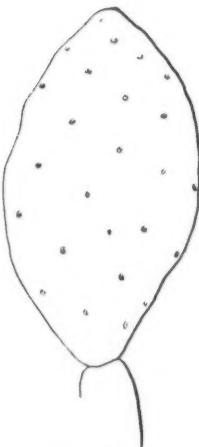


Fig. 5

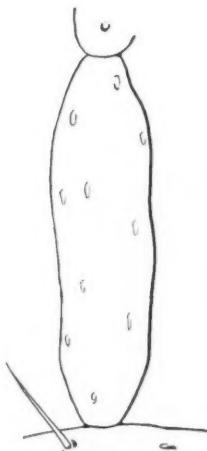


Fig. 6

SHAPES OF *OPUNTIA* JOINTS

Am I the only eager amateur the warmth of whose enthusiasm to determine the names of cacti by reference to a key has sometimes cooled because of inability to visualize the shapes described by words that are merely words and convey no meaning?

As one gropes, more or less blindly, through the labyrinth of technical terms with which all keys must teem, how discouraging it is to read in the dictionary that obovate means inversely ovate. The words convey no clear mental picture to be applied to the actual cactus.

I have tried in vain to find an illustrated botanical dictionary. I have searched through many books and pamphlets for pictures to help me visualize the forms.

Mr. Eric Walther, in his valuable contribution on "Botanical Keys" in the issue of February, 1930, of the *CACTUS JOURNAL* kindly included some excellent pictures to illustrate a few botanical terms, but so far as I am able to learn, no one has systematically supplied pictures to show the meaning of the descriptive terms used so freely in keys for the determination of cactus species.

So we beginners flounder along and guess at the shapes to which learned verbal appellations are attached.

I hope that these pictures, drawn by my faithful collaborator, Miss Margaret Kincher, illus-

trating some of the more commonly used terms, will help and encourage other beginners.

Let us take, as a typical example, six different *Opuntia* joints (which, by the way, many a beginner has thought to be leaves). If the pictures give a clearer conception of an obovate, or orbicular, or repand joint than the verbal description in the dictionary we shall feel pleased to have made it just a little easier for some to find out what the specimens in their gardens really are, and so added to their eagerness to push their studies further.

#### GLOSSARY

1. **Oblong**—perfectly or very nearly circular; said of a flat body like a leaf or petal. As in *Opuntia setispina*.
2. **Obovate**—inversely ovate; egg shaped with the point of attachment at the narrow end. As in *Opuntia affinis*.
3. **Orbicular**—elliptical, the length being twice or thrice the width, as in many leaves. As in *Opuntia maxima*.
4. **Repand**—having a wavy or uneven outline, tending to become sinuate (that is winding in and out as a margin). As in *Opuntia dillenii*.
5. **Elliptical**—long, oval, and equally rounded at both ends. As in *Opuntia ficus-indica*.
6. **Elongated**—very slender in proportion to length. As in *Opuntia elata*. var. *elongata*.

#### SPINES

The first nine drawings illustrate the shape, or characteristics, of various cactus spines; the last six refer to the manner in which they grow, or are attached to the joint or rib.

Fig. 1 represents a *subulate* spine, typical of *Opuntia subulata*, that generous *Opuntia* which condescends to retain all through life nice fat perfectly obvious leaves that need not be hunted for with a microscope. This type of spine is fairly thick at the base and tapers to a fine, slender point.

Fig. 2 illustrates the *conic* spine to be found occasionally on *Cereae*. This particular one is from *Cereus xanthocarpus*.

Fig. 3, an *acicular* spine, is needle-shaped, long or short. *Opuntia santa-rita* has acicular spines.

Fig. 4, *Ferocactus acanthodes*, and Fig. 5,

*Ferocactus wislizeni*, will leave no doubt as to the difference between *tortuous* and *hooked* spines.

The flowing hair of Fig. 6 immediately suggests the much sought after "Old Man," *Cephalocereus senilis*, although books refer to this type of spines merely as "bristles."

The spines of *Opuntia echinocarpa*, encased in their transparent paper-like sheaths, are hard to portray, but an effort has been made in Fig. 7, the dotted lines indicating the enclosed, or sheathed spine.

Easier to recognize is the *glochid*, in Fig. 8, that bane of the cactus grower and the collector; those perverse, short, barbed bristles which attach themselves so persistently to one's hands, or whatever part of the human anatomy is unfortunate enough to come in momentary contact

with them. *Opuntia microdasys* is a terrible example of this type.

The spine of *Homalocephala texensis*, shown in Fig. 9, gives an excellent idea of the *annulate* spine.

Now as to that important point in determining species, the position of the spines in relation to the plant. A *porrect* spine, (Fig. 10) is one that grows at right angles to the joint or rib, as in *Opuntia elata*.

*Pectinate* spines (Fig. 11) forms a perfect little double comb, as in *Echinocereus pectinatus*.

*Decurved* spines (Fig. 12) curved downwards, as in *Opuntia littoralis*, while *deflexed*, (Fig. 13) are bent down at an abrupt angle, as in *Opuntia chlorotica*.

Fig. 14 shows the difference between *central* and *radial* spines, "a" being central and "b" radial, an important distinction in many descriptions.

In Fig. 15, one sees the *appressed* spines of *Gymnocalycium spegazzinii* which bend sharply

back against the ribs.

#### GLOSSARY

1. **Subulate**—Tapering to a slender point.
2. **Conic**—Cone-shaped.
3. **Acicular**—Needle-shaped.
4. **Tortuous**—Twisting.
5. **Hooked**—Definition obvious.
6. **Bristles**—Slender, stiff hairs.
7. **Sheathed**—Encased in a thin, papery covering.
8. **Glochids**—Short, barbed bristles.
9. **Annulate**—Ringed.
10. **Porrect**—To stretch out radially.
11. **Pectinate**—Like the teeth of a comb.
12. **Decurved**—Curving downward.
13. **Deflexed**—Bent abruptly downward.
14. (a) **Central**—Extending from near middle of areole.
14. (b) **Radial**—Extending from outer edge of areole like rays.
15. **Appressed**—Pressed closely against rib or joint.

#### FLOWERS

A beginner, floundering about among joints and spines while attempting to identify specimens of cactus, eagerly welcomes the brilliant light that the many colored and varied flowers shed upon family relations.

Just for the sake of beginning at the beginning it should be said that a flower consists of a basal portion called the ovary containing ovules which are potential seeds. The ovary bears at its apex a *style* and some *stamens*. The *style* is a single, tapering stalk, sometimes branching, bearing at its upper end, or ends, a stigma of varying shape. The style is more or less surrounded by the stamens which, in cactus blossoms, are always very numerous. A stamen consists of a filament, or thread-like stalk upon the upper end of which is a knob called the anther. The anther bears the dust-like pollen which bees, or other carriers, take to the moist, naked surface of the stigma. Surrounding the stamens and style are the inner and outer floral envelopes, which, in many flowers, are spoken of as the corolla and calyx, and their respective sections as petals and sepals because the corolla and calyx are quite different in shape, color, structure and function. In many of the cactus

flowers, however, modern practice prefers to refer to these parts as perianth segments because they are very numerous and often poorly differentiated. For example, the inner and outer perianth segments of many cactus flowers vary but little in shape from each other, and the outer, which in other flowers would be called the sepals, shade gradually from dark and sober hue to the often brilliant colors of the inner segments, which would be the petals.

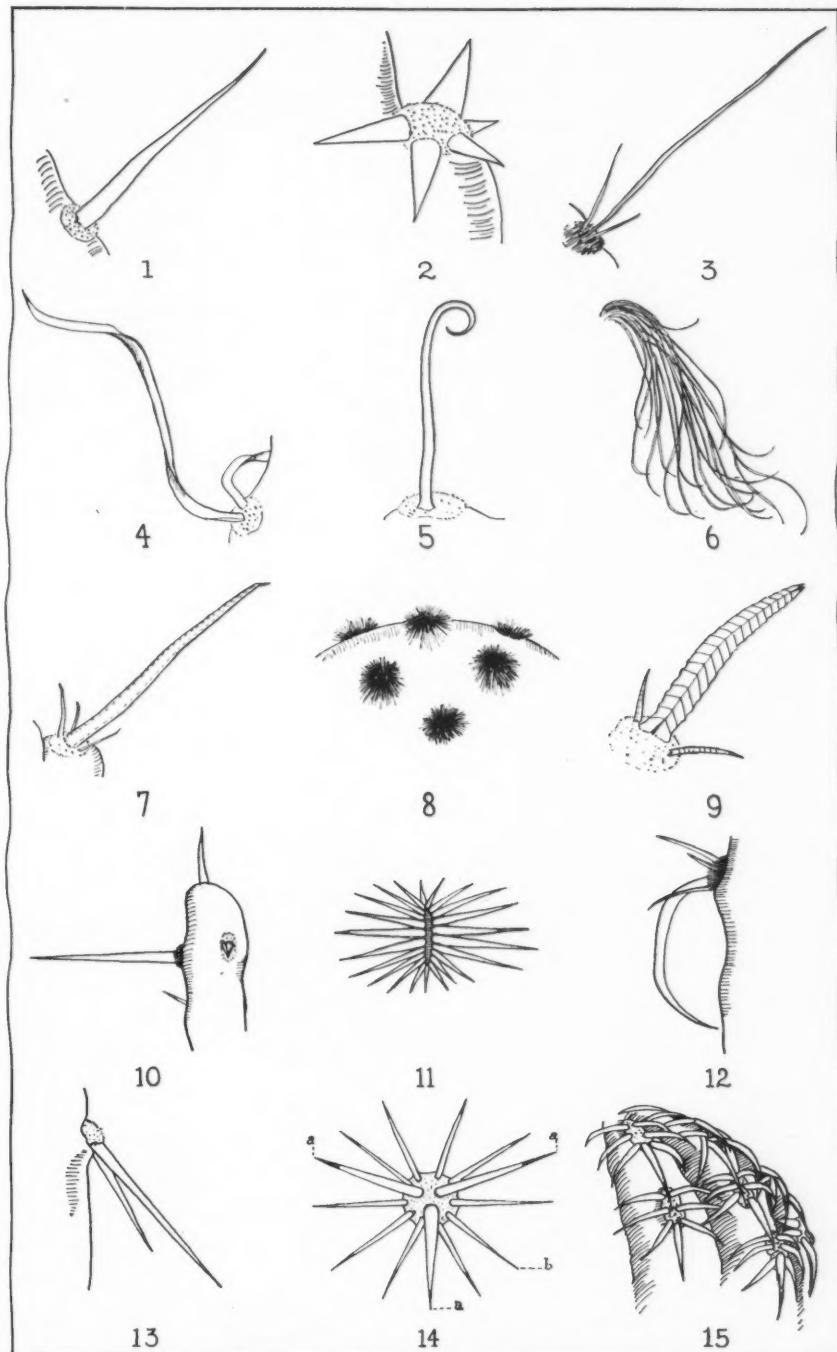
The principal characteristic of perianth segments, aside from color, by which different species can be distinguished is their shape and it is the technical terms employed to describe these shapes that the illustrations accompanying this article try to make clear.

The differences between cactus flowers and other flowers are:

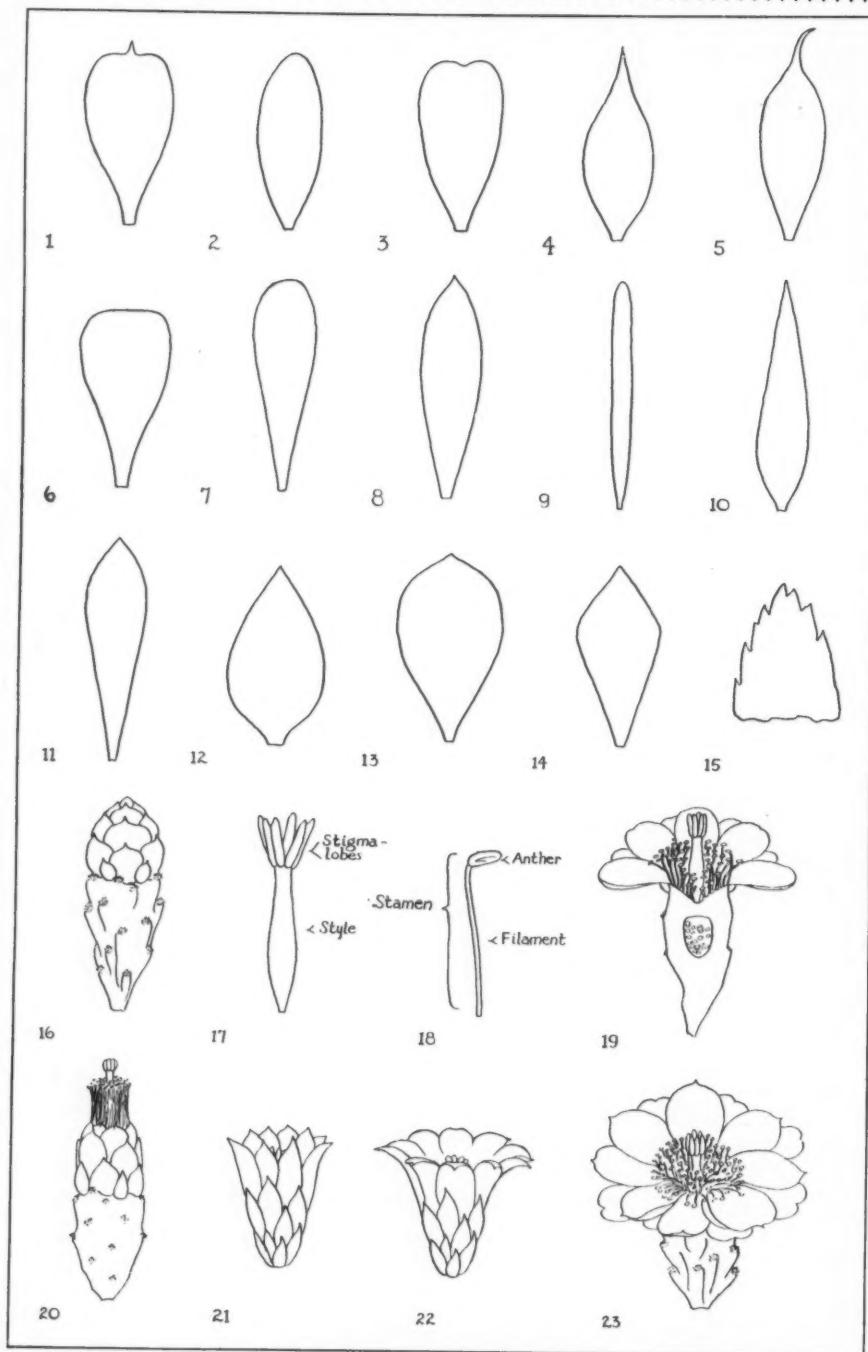
*First.* The petals and sepals are, in many cases, not sharply differentiated.

*Second.* The stamens are so numerous as to be almost uncountable.

*Third.* The ovary is not partitioned, although the occasional branching of the style indicates that this partitioning once existed but has been lost in the process of evolution.



SPINE SHAPES AND ARRANGEMENTS



FLOWER GLOSSARY

## GLOSSARY

1. **Mucronate**—Ending abruptly in a short, sharp point.
2. **Obtuse**—Blunt, or rounded at the extremity.
3. **Retuse**—Having a rounded end in which there is a slight depression, indentation or notch.
4. **Acuminate**—Ending in a long, tapering point.
5. **Caudate-acuminate**—Having a tail-like extremity.
6. **Truncate**—Ending abruptly.
7. **Spatulate**—Shaped like a spatula; oblong with an attenuated base.
8. **Oblong**—Length being two or three times the width.
9. **Linear**—Very narrow and elongate.
10. **Lanceolate**—Shaped like the head of a lance or spear, narrow, several times longer than broad, and tapering at each end.
11. **Oblanceolate**—Inversely lanceolate; tapering toward the base more than toward the apex.
12. **Ovate**—Egg-shaped.
13. **Obovate**—Inversely ovate.
14. **Rhomboid**—Oval and a little angular in the middle.
15. **Lacerate**—Having the edges of the apex jagged.
16. **Closely imbricated**—Overlapping like shingles on a house.
17. **Style and stigma-lobes**.
18. **Stamen**.
19. **Cross-section of ovary showing ovules and position of style and stamens**.
20. **Tubular flower**.
21. **Funneliform flower**.
22. **Campanulate flower**—Bell-shaped.
23. **Rotate flower**—Wheel-shaped with a very short tube.

## FRUITS

Last, but not least of the means of identification of cactus species, comes the fruit.

In some instances final determination can only be made by the fruit; as, for example, in the case of certain opuntias where it is of great importance to know whether the fruit is dry or moist.

A characteristic of the fruit of one species is usually characteristic of the fruit of the entire genus.

The shape of the fruit, as shown in the accompanying illustration, is an important element in the identification of species.

The manner in which the fruit opens for the discharge of its seeds, or the fact that it does not open at all, but merely dries up, are important indications of the species.

The word "inindehiscent" is applied to those fruits that do not split open. Most cactus fruits are indehiscent, drying with the cover on, like a tomato.

The term "dehiscent" is used to describe those fruits that split to permit the escape of the seed contents; such as some of the *Cereae* and most of the *Harrisias*, which split open irregularly.

*Bartschella schumannii* differs from all similar genera in that its fruits are circumcisile; that is opening by a transverse, circular line, so that the top separates like a lid.

A few cacti, such as *Neopotereria*, a genus native to Chile, dehisce by a basal pore; that is the fruit opens in a more or less regular line starting from the bottom at a basal orifice.

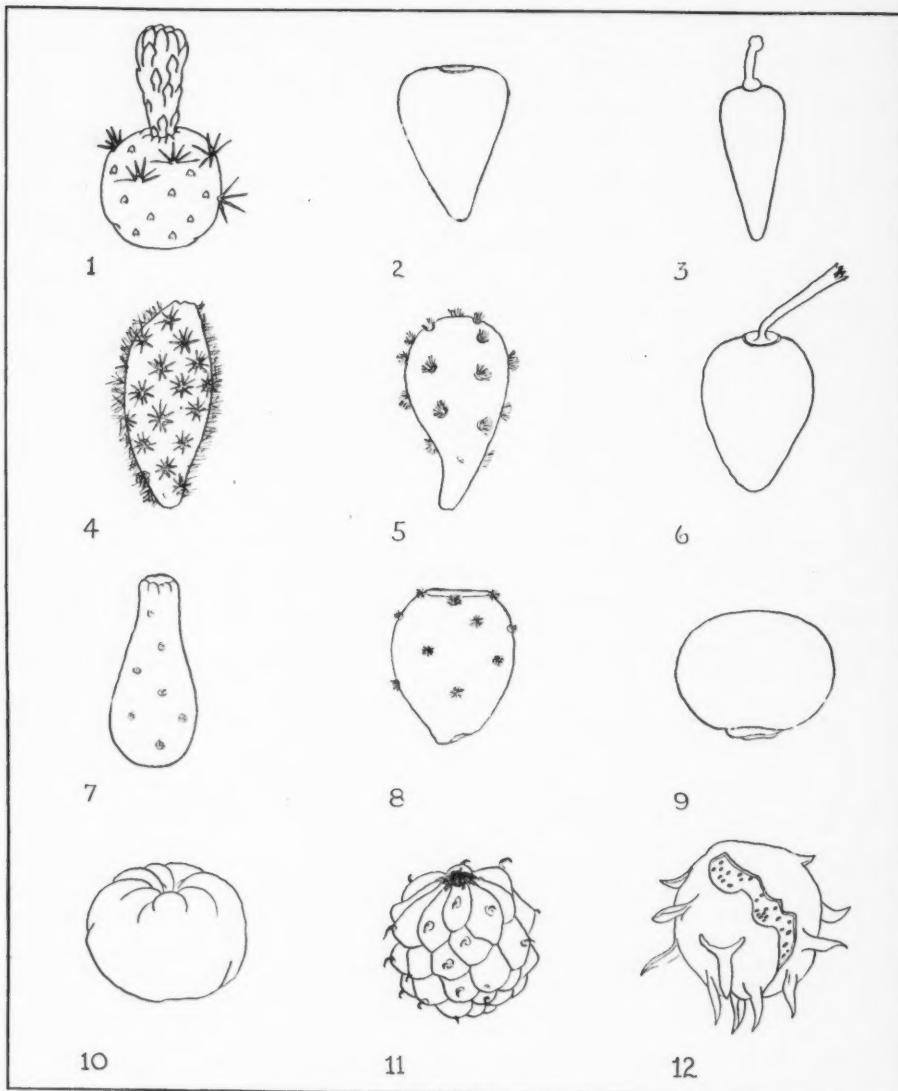
In some *Mammillarias*, the fruit does not appear till a year after the blossoming. If fruit seems to appear immediately after the flowering it proves, on examination, to be fruit from last year's flowers.

The fruit of many *Opuntias*, especially *O. vulgaris*, will quickly sprout and start new plants. One of the fruits that was picked to serve as a model for an illustration of this article sprouted in the dark box in which it lay.

It is not, however, merely as a means of identifying species that cactus fruit deserves consideration. Even the most indifferent among the uninitiated must be impressed with the spectacular beauty of the fruits, as well as flowers, as he rides by train for hours through the vast cactus covered areas of Mexico. The brilliant fruits, in addition to the flowers that often appear simultaneously on the same plant, form a striking element of color in the weird landscape.

The fruits of various cacti are an important staple of food in Mexico and other cactus producing countries. They are used as food both raw and cooked.

The great, handsome, pink fruits of the tall, columnar *Cereae* to all of which the Mexican gives the general name of "pitaya," are a spectacular sight in the markets and on the street stands. At almost every corner one sees a big cake of ice on which the ripe fruits of opuntias are cooling after having had the outer skin removed with a knife, and many Mexicans go munching them as they walk. Young *Opuntia* joints are cooked as a vegetable, and sweetmeats and preserves are made of the fruits.



#### GLOSSARY OF FRUITS

- 1. **Globose**—The shape of a ball.
- 2. **Obconic**—Inversely conical.
- 3. **Clavate**—Club-shaped.
- 4. **Ellipsoid**—Oval.
- 5. **Pyriform**—Pear-shaped.
- 6. **Obovoid**—Inversely ovoid.
- 7. **Urceolate**—Urn-shaped.
- 8. **Truncate**—Ending abruptly.
- 9. **Compressed-globose**—Flattened laterally.
- 10. **Umbilicus**—Navel-shaped depression in fruit.
- 11. **Tuberculate**—Covered with wart-like excrescences.
- 12. **Fruit bursting irregularly**.

NOTE: *Sub*—prefixed to any term means *somewhat*.  
Example: *subglobose*—somewhat rounded.

ND



## Interesting Things in Lower California

By HOWARD E. GATES

*Continued from July Journal*

*Phellosperma* is always considered to be a monotypic genus, but it seems very likely that *tetrancistra* will have to adopt a brother. On a bench just above the shore line on Vizcaino Bay, is a little fellow that appears to be without a home, unless he can find it in the *Phellosperma* household. Last year I probably saw it and passed it up for a young *Neomammillaria dioica*, which is also plentiful on the same bench. As I was driving the truck along the two tracks marking the main road, shortly after Easter, my companion remarked that he had just seen a pink flowered *Mammillaria*. There was no pink flowered "mam" supposed to be growing in that neighborhood, and if it were it would not have a flower large enough to attract attention from a moving vehicle, so I told him to make a noise when he saw the next one. Well this fellow turned out to be a little thing seldom over two and a half inches in diameter and not even that high, single headed usually, having a heavy fleshy root, a darker colored plant than *Tetrancistra*, but a very similar flower. I am hoping to see the seed some day and if it has a corky base, you will probably read about *Phellosperma pacificus*. That is, if somebody does not bob up with a publication of the year 1883 telling all about it. At present we will just call it No. 144.

When it comes to *Neomammillarias* one cannot get them all straightened out in two trips or probably a half a dozen long trips. They vary greatly in appearance. *N. Brandegeei* along the cool, foggy, northwest coast seems easy to identify, but near Calmali in the hot, dry desert, is another milky one that may be the same, yet there is a good big question mark.

The only place I have been sure of finding *N. peninsularis* is on Cape San Lucas, where it is plentiful and true to description. This year near Mission Todos Santos, some fifty miles to the north of the Cape, I found another belonging to this group, yet differing in that it was spinier and more robust. This one is No. 135.

On the summits of the Sierra Laguna from four thousand feet up is found *N. petrophila*, a milky one, with long, straight spines and some wool. The distribution is officially in the higher

parts of these mountains, yet Messrs. Baxter and Frick found a somewhat similar plant near the shore west of San Jose del Cabo. I found a different one just east of Cape San Lucas and still a third form a little inland from San Jose del



Undetermined milky *Neomammillaria* from coast near Cape San Lucas

Cabo. The question is, are they all variations of *N. petrophila* or are they distinct species? If they are other species they do not fit the description of any recognized species, yet they are in the territory that has been most thoroughly worked by trained botanists.

To the south and east of La Paz is another milky *Mammillaria* among the granite rocks of Vin Ramos. It is spiny and woolly. Last year

I considered it was probably *N. arida*, but this year my explorations proved it is not. It may be *N. evermanniana*, but if it is, it is a long ways from home. I have not had the opportunity as yet, to visit Cerralboa Island and run down *evermanniana* on its native hillsides.

Last year I sent out No. 68 as an undetermined *Neomammillaria*. This slender headed, clustered plant occurs in only one valley to the



*Lophocereus schottii* monstrous and regular form

south of La Paz. This year I found it in fruit and now I am suspicious that it is a *Cochemeia*. The general appearance of the plants is dark, the tubercles very distinct, the central spine of each cluster strongly hooked. The fruit is long, swollen near the tip and of a red color. It could pass for either a *Neomammillaria* or a *Cochemeia*.

*fruit* as it strongly resembles Britton & Rose's drawing of *C. pondii* fruit. Whenever this species flowers there should be no difficulty in determining which it is. If it proves to be a *Cochemeia* it is probably an unrecognized species.

My closing one is one I will locate as "somewhere in Lower California" as it occurs sparsely in a very limited area and could soon be cleaned out. It appears to be a monstrous form of *Lophocereus schottii*. The ridges of this are replaced by smooth skinned, irregularly placed protuberances. There are no spines or hair on these plants. A peculiarity of it is that regular and monstrous forms of branches have not been observed on any one plant.

I spent nine weeks in 1928, fourteen weeks in 1930, and twelve weeks this year searching the Peninsula from one end to the other and it does not seem as though I am any nearer a complete understanding of the mysteries of the Peninsula than I was when I started. I would like for my "Good Angel" to finance a couple of years of exploring there, and I suppose when I got through with that there would still be so much to do I would ask for a couple of more. Whenever I am satisfied any of the above are thoroughly observed I hope to write some scientific descriptions. Though apparently I have seen as much of the cacti of this Peninsula as any living man, I do not feel qualified as yet. To avoid increasing our endless confusion, this work must be so thoroughly done that it should stand for all time.

#### MINIATURE GREEN HOUSES

Here is an idea: a hothouse for cliff dwellers of our metropolitan centers of population. The green house was entered as an exhibit at the San Francisco Cactus and Succulent Show by Mr. John R. Wright, the dimensions are 28x36 inches, and convenient to carry should the landlord become too persistent about the rent. It is built shed-shaped with the roof of glass; the sides have no air vents so that no soot or auto exhaust gas can reach the delicate plants. Two large hooks strapped to the back of the hothouse are used to hang it out into space from the outer railing of the fire escape; the glass roof can be held at any angle when lowered or raised, and it was painted green to give the house a country atmosphere.

Mr. Wright's plants, which were rare and splendid specimens, did not seem to miss the open spaces of their native habitat, and appeared contented and happy in their cramped quarters.

Hasten the day when the rails of fire escapes of the tenement districts of New York and Chicago will be loaded with these little hothouses full of plants for the enjoyment of those who must live in congested areas.

G. A. FRICK.

## The San Francisco Cactus Show

From Notes of Boyd L. Sloane

The San Francisco Cactus and Succulent Show was a success in every way. Quality rather than quantity was the keynote of all exhibits which were arranged in a most artistic manner. Among those sponsoring the Show were Mr. W. D. Harney, Eric Walther, James West, John R. Wright, and Mrs. Katherine Karle, all of whom deserve great credit for success of the show. Among the many attractive exhibits were:

Community exhibit, artistically arranged by Archibald Burns. A general collection of cacti and succulents occupied the entire end of the room with a large *Agave*, *Aloe* and *Cereus* as the center of interest. The plants were contributed by Golden Gate Park and private parties.

Mrs. J. A. Scannavins showed some attractive Xerophyte groupings and well grown specimens of cacti and succulents.

Mrs. Edith F. Davidson's group of *Echeverias* and *Kalanchoes* attracted favorable comment and three *Astrophytum asterias* were in flower.

Mrs. Wm. F. Taylor had many *Echeverias*.

P. C. Boehmer showed 73 varieties of cacti seedlings.

Victor Reiter, Jr., exhibited *Gasterias* and *Sedums*. Eric Walther had an extensive and authentic col-

lection of succulent photos with *Echeverias* predominating.

State Department of Agriculture and Plant Quarantine Service exhibited pests injurious to California plant life.

Mrs. Hechinger exhibited plants from the garden of the late Chas. Abraham.

Thomas Cactus Garden of Decoto had one of the most interesting exhibits in which cacti predominated in a rocky display.

Mrs. W. D. Harney had a feature exhibit showing many *Lithops*, *Cepalocereus senilis* and seedlings.

Mrs. George Meyer won first prize on Best Bowl and had an outstanding *Aloe arborescens* and the most gorgeous *Rochea coccinea* in the show.

Victor Reiter presented an educational arrangement of the family *Crassulaceae* with its subfamilies of each.

Otto R. Schroller attractively arranged fine specimens of *Cerei* and *Neomammillarias*.

Paper weight gardens were shown by Mr. Clark who described them in the JOURNAL last March.

Mr. John R. Wright brought a miniature greenhouse, designed for fire-escape. Much interest was shown in this unique exhibit.

## Some Northern California collectors and their gardens

By JAMES WEST

Northern California, the San Francisco Bay region in particular, has in recent years become one of the most prominent centers of our hobby. Geographically it marks about the northern limits to which the majority of succulent plants may be successfully grown out-of-doors. In the neighborhood of San Francisco some of the Euphorbias may (with due precautions) be ventured upon, but by the time the Oregon boundary has been reached, practically everything has been eliminated as a practical possibility except alpine *Sempervivums*, *Sedums* and perhaps the hardiest of the *Opuntias*. This is due probably as much to the increased rainfall as to low winter temperatures.

As elsewhere in California, the climate around the Bay is subject to exceedingly great variations from elevation, distance from the coast, shelter from prevailing winds and other factors. Within 20 miles of San Francisco may be found differences of 100% or more in the average rainfall and of 10 to 20° in the minimum temperatures. It will therefore be easily understood that it is rash to generalize about the hardiness of any particular plant in the region in general, but it may be said that the *Crassulaceae* of nearly all genera seem to do exceptionally well. *Aeoniums* thrive in San Francisco, not so well farther from the immediate coast, *Echeverias*, *Sedums* and *Sempervivums* everywhere; *Cactaceae* do better away from the

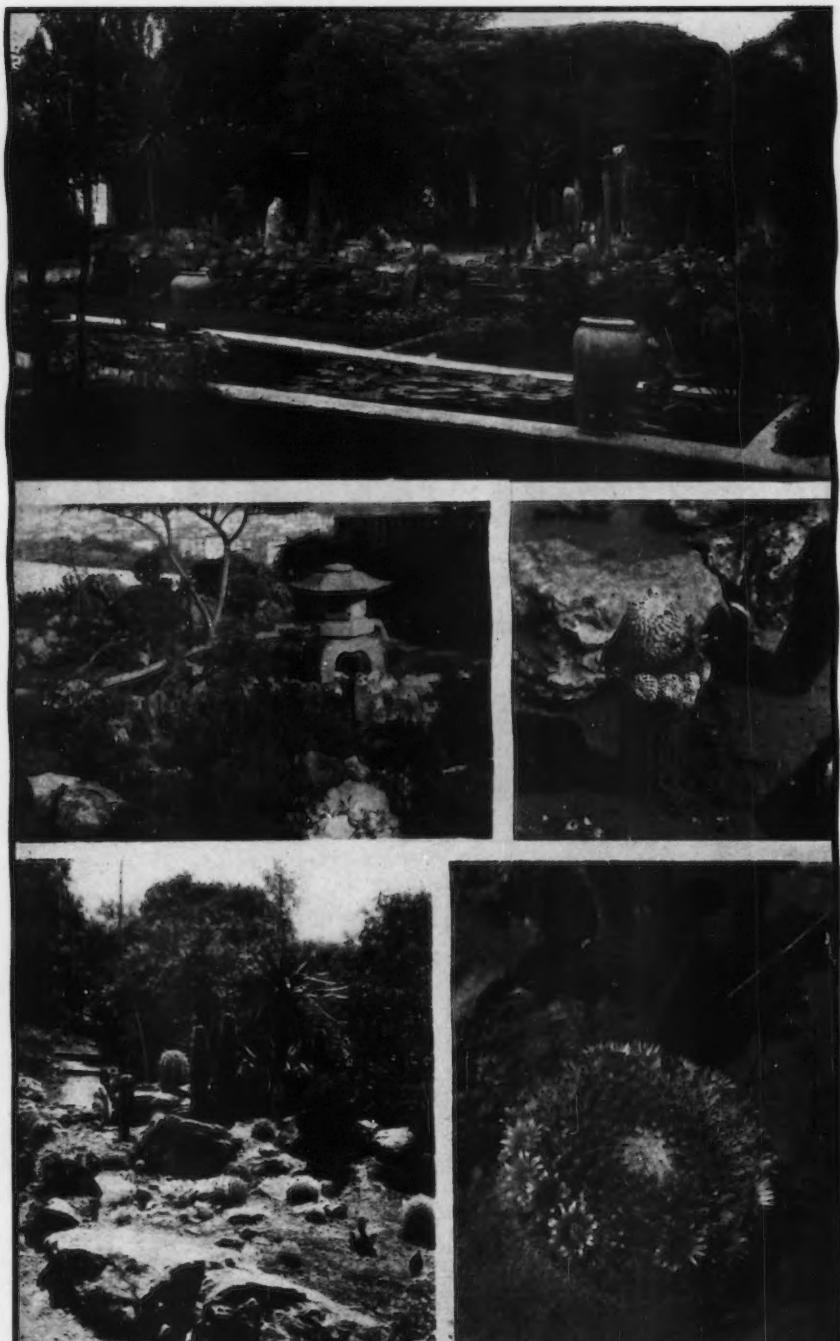
ocean, as in the East Bay and Santa Clara county, *Mesembrianthemums* seem to do well generally. Recently so much new material has been introduced and tried, the test of a really severe winter will have to be awaited for final judgment.

For the benefit of visitors to the San Francisco Show, it may not come amiss to give a short and necessarily incomplete survey of the more prominent collections in this region.

Although he is no longer among us, it is fitting to begin with the name of Charles Abraham, long the dean of collectors whom many of us remember. His nursery in San Francisco, containing in his time one of the best and also oldest collections of succulent plants, is now ably conducted by his niece, Mrs. L. Hechinger, and her husband.

Mr. and Mrs. Jay A. Barrett are a pair of enthusiastic members in whose place on the Berkeley Hills something new may always be found, particularly in *Dudleyas* and *Echeverias*, in the setting of a picturesque rock garden, full of interesting things.

When it comes to *Cactaceae*, few can match Harry L. Bettencourt of San Leandro in number of rare species or beauty of specimens. In a garden of no more than average size and without any particular advantages of climate he has succeeded, by skill, knowledge and hard work, to build up a collection of quite exceptional merit.



TOP: Garden of Mrs. W. D. Harney, San Mateo.  
CENTER LEFT: Garden of Mrs. Horace Jenkins, San Francisco.

CENTER RIGHT: Grafted plant of *Solisia pectinata* in flower,  
H. L. Bettencourt collection, San Leandro.

LOWER LEFT: Part of the cactus garden on the Max. M. Cohn estate, Los Gatos.

LOWER RIGHT: *Neomammillaria macdougalii* in Burns collection, San Rafael.

Best of all, his enthusiasm is of such a quality that he seems to be able to infect others with the virus. We have no better booster for the cause. We must not forget to mention his near neighbor, Mr. Ch. Achermann, another stout supporter of the society and a successful raiser of seedlings.

Next in our alphabetical course we come to Archibald Burns of San Rafael. His training as an artist, in combination with plant-sense and capacity for hard work, have enabled him in an astonishingly short time to build up a rock garden-nursery, already famous for beauty of design and number and rarity of specimens, cacti and Mesembrianthemums being particularly well represented. Worth going far to see.

*At the other end of the bay, in San Jose, we find A. T. Carlson, a lover and grower of rare plants of all kinds, recently more and more interested in cacti and succulents.*

The magnificent estate of Mrs. Max M. Cohn in the foothills of the Santa Cruz mountains near Los Gatos with its extensive and beautifully kept cactus garden will be remembered by all who were privileged to see it at the memorable meeting of the society two years ago. The cactus garden has since then been considerably enlarged and is more full of interest than ever.

In the sandy (and foggy) Sunset district of San Francisco we find the charming garden of Mrs. Henry Davidson, in which Echeverias, Sempervivums and a host of rare succulents luxuriate, in obvious response to the skilled care of a loving hand. Not far distant we find Parlin Estes with the able assistance of his mother, growing cacti and Agaves within sound of the breakers, and making them like it. A good collection of choice Mesembrianthemums and other succulents is under glass.

Comparisons are proverbially odious, but few will deny a place in the front rank to the garden of Mr. and Mrs. W. D. Harney in San Mateo, both for extent of the collection and for beauty and rarity of the specimens. Greenhouses, lath-houses, several rock gardens literally overflow with everything that is best and rarest in the entire field. The kindly owners are known to practically all our California members from their frequent and always welcome visits to other collections all over the state. The trained eye of Mrs. Harney will detect a new or rare plant, however small or hidden, with unerring precision, and unless the owner be exceptionally hard-hearted, it will, by exchange or purchase sooner or later find its way to a new home in San Mateo. A large proportion of the plants, however, are home grown, the myriads of well-grown seedlings of many species forming one of the major attractions of the place.

A collection as complete as this is of great value

to the study of botany, which has to depend on intelligent private enterprise of this kind for its material. Soon we hope in these pages to give the Harney collection the more detailed description it deserves.

Commanding the full sweep of the Pacific, on the bluffs above the Cliff House in San Francisco is the garden of Mr. and Mrs. Horace Jenkins, a place of far more than local fame. Almost entirely devoted to succulents, it is a personally conceived and executed translation of the japaenesque into terms of new material adapted to the severe local conditions of summer wind and sea fog. Our president emeritus made the remark in this garden that one could not make a sailor out of a cactus, but Mrs. Jenkins has come as near as may be to performing this miracle.

The other succulents, at any rate, seem to be enjoying a life by the ocean wave, becoming more colorful and compact the more the salt winds blow; magnificent Aloes, sheets of Mesembrianthemums in flower, forests of Aeoniums. When bigger and better Aeoniums are grown, Mrs. Jenkins will grow them.

High up on the flank of Tamalpais in his red-wood-sheltered garden, Frank Kenne reigns as undisputed king of the realm of Sempervivum and Sedum. In a hundred nooks and corners, on benches, in half a dozen home-built greenhouses of all shapes and sizes, you will find pots and pans, flats and boxes teeming with alpine Sempervivums in scores of species, Sedums, Rosularias and other things without number in all stages of growth. All manner of chemical glassware is put to horticultural use, funnels, jars and what not, ingeniously serving for bell-glasses. Besides Crassulaceae there are cacti and lilies, Saxifragas and Stapelias, something for everybody. It is all very obviously a labor of love.

We must not fail to mention the collection of our excellent and hard-working secretary of the Northern Branch, Mrs. Katherine Karle, located in Los Gatos. It contains many wellgrown specimens of cacti, even under the handicap of only week-end care.

Dr. M. Morgan of Richmond has a small but choice collection containing many good Mesems and rare imported cacti, also seedlings, with dwarfed trees and rare tropical fish for variety.

One of the outstanding collections in the entire region is to be found in the garden of Victor Reiter at the foot of Mt. Davidson in San Francisco. Commencing as a rosarian, he became a convert to rock gardening and thence to the collecting of succulents. With our friend Eric Walther acting as a botanical advisory committee, we are not surprised to find one of the most complete collections of Echeverias in the country.

Gasteria is another genus very completely represented. A large part of the plants are grown from seed with great success. The care of these, an extensive and ever-growing rock garden and a greenhouse full of treasures keeps the owner busy, as may be imagined. Having the advantage of youth combined with a serious interest in botany and horticulture we may expect him to make this garden ever more interesting.

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## THE CACTUS AND SUCCULENT SOCIETY OF AMERICA

*An International Society for all lovers of Xerophytes*  
Headquarters: LOS ANGELES, CALIFORNIA

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SOCIETY MEMBERS IN ENGLAND  
WIN PRIZES

28 Northampton Road,  
East Croydon.

Editor Cactus Journal:

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In the other division for amateurs who do not employ a gardener, Mr. Farden was successful in taking the third prize, with three splendid plants, *Hechtia argentina*, *Echeveria rubra* and an *Aloe* from Pondonland, whilst the writer was awarded second prize for *Echinocactus grusonii*, *Astrophytum myriostigma* and *Euphorbia obesa*. The winner of the first prize showed *Echinocereus pectinatus*, *Astrophytum ornatum* and *Echinocactus nidulans*. All the exhibitors are keen growers, and we hope to make the most of the opportunities of the Amateur Show and let people see how interesting Cacti can be.

I am a recent member of your Society and am finding the JOURNAL full of interesting matter and the illustrations are beautiful and very helpful.

Yours faithfully,

VERA HIGGINS.

## WANTED—OTHER SUGGESTIONS

Editor of Cactus Journal:

As soon as the index for the second volume of the JOURNAL is ready I wish you would mail me one, at my home address, 1349 La Veta Terrace.

I hear so many beginners, who are subscribers, saying that there is too much heavily scientific matter and not enough popular discussion. Likewise, they would like considerable news about cactus, such as who is putting in a big new garden, where there is an extraordinary specimen, big as a tree, how this or that garden came to be established. Seems to me the JOURNAL might well carry two or three pages of short items, news and information, appealing to amateurs or beginners, to leaven up the scientific. I am merely making these suggestions in a friendly spirit in order that they may be discussed. That's the only way we ever get anywhere—exchanging ideas. Thanks in advance for past favors.

Cordially,

HOWARD C. KEGLEY.

EDITOR'S NOTE: We appreciate the above and earnestly hope that others' opinions will be expressed so that we can please the majority of our subscribers.

## 20 ACRES OF CACTI

Actually lost in a cactus garden—that was the experience of the Editor recently when he visited the garden of Mr. and Mrs. John Wright in Santa Barbara. With ten acres already planted, Mrs. Wright finds it necessary to add another ten acres. Without doubt Mrs. Wright is doing the greatest scientific work since the publication of THE CACTACEAE by Britton and Rose, and her wonderful collection will be of utmost value in the reprinting of Vol. I.

**IMPORTANT NOTE:** Plant names are printed as received from the advertiser. The Journal does not change the spelling in any way.

**PLANTS—CACTI**

**COLLECTION OF 100** assorted cacti. Most of them suitable for outdoor planting, 10 or more varieties in collection including one *P. Greggii*. All blooming size, \$5.00 express collect. Free with each order for next 30 days, 25 bowl-size cacti. Special wholesale price list to dealers on request. Have about five varieties that grow to extra large size very attractive for outdoor rockery. Prices on request for extra large specimens. A. R. DAVIS, P. O. Box 167, Marathon, Texas.

**RARE WEST INDIAN CACTI**—*Cactus intortus*, *Leptocereus quadricostatus*, *Hylocereus trigonus*, *Cephalocereus rostenii*, *Harrisia portoricensis*, *Euphorbia laetae*, *Pedilanthus tithymaloides*, *Opuntias*. Write for prices. G. ANTON, P. O. Box 698, Mayaguez, P. R.

**RAREST CACTI**, *Echeverias*, *Euphorbias*, *Gasterias*, *Haworthias*, *Mesembrianthems*, *Sedums*, *Sempervivums*. Also *Cactus Seed* and *Seedlings*. All books on *Cacti*. Illustrated catalogue, 25c. MCCABE CACTUS GARDENS, 6721 Imperial Ave., Route 3, San Diego, Calif.

**SURPLUS CACTUS** plants for sale at 5c-25c each, including *Cerei*: *Spachianus* & *Emoryi*, various *Opuntias* and large specimens *Ferocactus Viride*, *c. Echinocactus Polycyphalus* and *Echinocereus Engelmanni*. Rooted O. *Ramosissima Cristata*, 50c up. MRS. M. H. STEELE, 3030 Potomac Ave, Los Angeles, Cal.

**TEXAS CACTI** and odd plants. Bulk, well-rooted, healthy. Specimen plants in pots. Dish gardens. BUFORD W. HALL, 520 East Ninth Street, Los Angeles. Agent Hyde Park Floral Co., Austin, Texas.

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**ECHEVERIA ROSEII** 25c up. Thousands of succulents at equally low prices. See my rock garden 120 ft. long filled with rare plants. No mail orders. RARE PLANT MARTIN, 2311 San Gabriel Blvd. (South of Valley Blvd., North of Garvey Blvd.)

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**SALE OF SURPLUS STOCK**—Many rare plants including *Persikias*, *Pereskias*, *Echinopsis* (many being offered for the first time), *Epiphyllums*, *Echinopsis*, *Echeverias*, etc. This is the season to set out your cactus and succulent garden. Sale Aug. 24 to 31 inclusive. DR. A. D. HOUGHTON, 14714 Chatsworth Drive, San Fernando, Calif.

**SEEDLINGS**

**10,000 MEXICAN** and South American cactus seedlings. Four strong plants of my selection sent for \$1.00 postpaid. Free list on request. Visit my cactus and succulent ranch of over one hundred thousand plants from 5c up. Descriptive catalogue of cacti and succulents, 20c in stamps. E. P. BRADBURY, N. Mango Ave., Fontana, Calif.

**CACTUS JOURNAL**

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Marengo St. with \$2.00. The index has been carefully compiled by Mr. Baxter and will be bound into each volume. The index will be mailed to all who have made a request.



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**RARE CACTUS SEEDS** that are fresh: *Euphorbia obesa*, each seed, 25c; *Astrophytum Asterias*, 25 seeds, 60c; *Astrophytum Asterias Capricorne*, 25 seeds \$1.50; *Astrophytum Myriostigma*, 25 seeds, 80c; *Oreocereus irigoinii*, 25 seeds, \$1.20; *Cereus Alamosensis*, 25 seeds, 35c; *Cereus greseus*, 25 seeds, 35c; *Cereus grandiflora*, 25 seeds, 25c; *Cereus chilensis*, 25 seeds, 45c; *Pilocereus ciliatus* var. *rubriflorus*, 25 seeds, 40c; *Pilocereus Strausii*, 25 seeds, 40c; *Echinocactus chilensis*, 25 seeds, 60c; *Echinocactus cupreatus* (Chile), 25 seeds, 50c; *Echinocactus gibbosus* v. *Ferox cristata*, 25 seeds, 50c; *Echinocactus gilesiorianus*, 25 seeds, 60c; *Echinocactus Haselbergerii* (Brazil), 25 seeds, 50c; *Echinocactus nivosis*, 25 seeds, 45c; *Echinocactus Senilis*, very rare, 25 seeds, 45c; *Mamillaria Guzowiana*, very scarce, 25 seeds, \$1.25; *Mamillaria Schiediana*, 25 seeds, 40c. Assortment of 30 varieties separately packed and correctly labeled. The very best value this year, \$2.50. Booklet on "Cacti in the Home" post paid, 25 cents. Our list of over 500 varieties of cacti seed is free for the asking. T. R. SCHROEDER, 4821 Strong St., Chicago, Ill.

**VERY IMPORTANT**—My special list of cactus seeds, gathered by Curt Backeberg on his explorations trip through Peru, including all the rarities and discoveries, as *Epstoia gigantea* Bckbg., sp. n., *Epstoia Humboldtii* Bckbg., *Epstoia Dautwitzii* Bckbg., *Epstoia Dautwitzii* v. *Haagei*, *Epstoia gigantea cristata*, *Brownningia* (Br. & R.), *candelaris* Meyen. For the first time since 1834 these seeds are available together with many new novelties and discoveries. List sent upon request. Once on my mailing list, you will receive all future lists. HERMAN TOBUSCH, Cactus Seeds and Seedlings, 632 So. Wisconsin Ave., Villa Park, Ill.

**SUCCULENT SEEDS** direct from Africa. *Euphorbia Obesa*, 6 seeds, \$1.00; *E. meloformis*, 3 seeds, \$1.00; *E. inermis*, 2 seeds, \$1.00; *Aloe variegata*, 100 seeds, \$1.00; *A. longistylis*, 100 seeds, 50c; *Mesemb. Pleiospilos simulans*, 100 seeds, 50c; *M. pleiospilos bolusii*, 100 seeds, 40c; *M. glottiphyllum neili*, 10 seeds, 25c. JOHN COUTTS, Kendrew, South Africa.

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**CACTUS JOURNAL**—Bound copies Vol. I, complete with index \$6.00. Subscription price (monthly) \$3.00 year (foreign \$3.50). "Texas Cacti" by Ellen D. Schulz and Robert Runyon, many illustrations, \$1.45. "The Cactus Book" by Dr. A. D. Houghton (President Emeritus of the Cactus Society), \$2.25. CACTUS AND SUCCULENT SOCIETY OF AMERICA, 1800 Marengo St., Los Angeles, California.

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**RESEARCH SERVICE**—General botanical research. DR. DONALD A. JOHANSEN, Box 32, Stanford University, Calif.

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*A monthly magazine devoted exclusively to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and the study of these particular plants may attain the popularity which is justly theirs. "The Cactaceae," by N. L. Britton and J. N. Rose, has been adopted by this Journal for purposes of identification.*

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Los Angeles, Calif.

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11224 Chatsworth Drive  
San Fernando, Calif.

#### SOCIETY MEMBERS IN ENGLAND WIN PRIZES

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Editor of Cactus Journal:

As soon as the index for the second volume of the JOURNAL is ready I wish you would mail me one, at my home address, 1349 La Veta Terrace.

I hear so many beginners, who are subscribers, saying that there is too much heavily scientific matter and not enough popular discussion. Likewise, they would like considerable news about cactus, such as who is putting in a big new garden, where there is an extraordinary specimen, big as a tree, how this or that garden came to be established. Seems to me the JOURNAL might well carry two or three pages of short items, news and information, appealing to amateurs or beginners, to leaven up the scientific. I am merely making these suggestions in a friendly spirit in order that they may be discussed. That's the only way we ever get anywhere—exchanging ideas. Thanks in advance for past favors.

Cordially,  
HOWARD C. KEGLEY.

EDITOR'S NOTE: We appreciate the above and earnestly hope that others' opinions will be expressed so that we can please the majority of our subscribers.

#### 20 ACRES OF CACTI

Actually lost in a cactus garden—that was the experience of the Editor recently when he visited the garden of Mr. and Mrs. John Wright in Santa Barbara. With ten acres already planted, Mrs. Wright finds it necessary to add another ten acres. Without doubt Mrs. Wright is doing the greatest scientific work since the publication of *THE CACTACEAE* by Britton and Rose, and her wonderful collection will be of utmost value in the reprinting of Vol. I.

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There will be no further sample copies mailed to the members since the *Journal* will be a self supporting branch of the Club's activities and only those subscribing will receive the August issue. You cannot afford to miss a single issue since they should be kept for binding and will no doubt some day be at a premium since much of the material has never before appeared in

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